

REMARKS

This is in response to the Office Action mailed September 25, 2003 (herein, "Office Action"). A petition and fee for a THREE MONTH extension of time is filed herewith. Notwithstanding, please consider this paper a petition for a three month extension of time. Including the amendments made in this paper, claims 1-44, 46, 48-92, and 94-100 are pending. In this paper, Claims 45 and 93 have been canceled, claims 22, 46 and 100 have been amended. This amendment is fully supported by the specification as read by one of ordinary skill in the art at the time of the invention. No new matter is presented.

Before addressing each specific rejection of the Office Action, Applicant notes that the Office Action repeatedly asserts that the EVOH barrier layers of **Idlas** (U.S. Patent No. 5,769,648) ("**Idlas**") are "functionally equivalent" to other barrier layers described in the prior art. By suggesting that all barrier layer film materials are "functionally equivalent," the Office Action loses sight of how one skilled in the art would read relevant references in the art. For example, in selecting polymers for a barrier layer, one skilled in the art considers not only the *end function* of each layer and corresponding polymer materials, but also the *steps required to manufacture and process* the final multilayer film product. Other properties of potential barrier layers, such as their different moisture permeabilities or melting points, and not just their function in a completed multilayer film, would also inform selection of which barrier layer material to use.

Idlas is improperly combined with the references discussed below as a basis for rejection under 35 U.S.C. § 103(a). Applicant respectfully asserts that at least with respect to one property of the films of the present invention – that of providing a moisture barrier – one skilled in the art would understand that the EVOH barrier layers of **Idlas** cannot be simply deemed a "functionally equivalent" substitute to other barrier materials, as the Office Action's reasoning suggests.

For example, one skilled in the art would recognize that certain barrier layers have higher moisture permeabilities than others, as evidenced by **Exhibit A**. One skilled in the art

would recognize that certain barrier layers comprising vinylidene chloride copolymers provide both oxygen barrier properties (see, for example, the specification of the present application at page 10, lines 5-8), and enhanced moisture barrier properties compared to EVOH. More specifically, manufacturer specifications from Dow for the MA-SARAN product (enclosed herein as “Saran Resins and Films: Moisture Barrier Performance,” © Dow Chemical Company 1995-2004) recites that MA Saran provides “moisture barrier performance that keeps dry foods dry and crisp,” and the accompanying graph indicates that MA-Saran provides a Water Vapor Transmission of about $19 \text{ g um/m}^2 \text{ day}$. (Attached as **Exhibit A**). In comparison, in the same graph, an EVOH layer provides a Water Vapor Transmission of about $600 \text{ g um/m}^2 \text{ day}$. MA-Saran by Dow, is generically described in the specification, for example at page 9, line 7. Other potential barrier polymers are shown in **Exhibit A**, each having very different Water Vapor Transmission rates.

The specification of the present invention notes that some embodiments provide films with, among other things, “good barrier properties including high barriers to oxygen and water permeability.” (Specification, page 10, lines 25-26.) Furthermore, the specification states, “[t]he inventive film, bag, process and package of the present invention may be used as a heat sealable, oxygen and moisture barrier film... .” (Specification, page 10, lines 27-28). While the second and fourth layers also provide moisture barrier properties (see, for example, the Specification at page 21, lines 21-22 and page 22, lines 7-10), one skilled in the art would recognize that a third layer comprising vinylidene chloride with 2-20%wt of methyl acrylate, such as MA- Saran, also provides beneficial moisture barrier properties to the films of the invention.

Given the difference in moisture barrier properties and processing conditions for different barrier layer materials, one would not think to “swap out” the EVOH barrier layer of **Idlas** and “drop in” other oxygen barrier materials that the Office Action points to from other prior art multilayer films and still expect to successfully be able to process and produce the films disclosed herein.

Applicant requests the rejections made in the Office Action under 35 U.S.C. § 103(a) based on the alleged “functional equivalence” of such layers be withdrawn for the reasons as noted specifically below.

CLAIM REJECTIONS

Applicants first note that the Examiner has not made a prior art rejection against claim 100, and kindly request an indication of allowable subject matter.

I. Rejection of claims 93 and 100 under 35 U.S.C. § 112, 2nd ¶

Claims 93 and 100 stand rejected under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite. Specifically, the Office Action asserts that claims 93 and 100 are dependent on claims that “inherently provide barrier properties” and so claims 93 and 100 allegedly “appear to contradict their parent claims and render the claims unclear as to what type of layer is meant to be excluded from the film.” (Office Action at page 2).

Without conceding the validity of this rejection, Applicant has elected to amend the claims. Applicant has canceled claim 93 and amended claim 100 to exclude core oxygen barrier layers. Claim 100 depends from claim 48. Applicant submits that claim 100 as amended is not indefinite, and as described in the specification, for example at page 19. Reconsideration and removal of this rejection is requested.

II. Rejection of claims 1-21, 48-87 and 94-99 under 35 U.S.C. § 103(a) over Idlas, Lustig and Peiffer

In the Office Action mailed September 25, 2003, the Examiner rejected claims 1-21, 48-87 and 94-99 under 35 USC § 103(a) as being obvious over **Idlas** in view of **Lustig et al.** (U.S. Patent No. 4,863,769) (“**Lustig**”) and in further view of **Peiffer et al.** (U.S. Patent

No. 6,063,482) (“**Peiffer**”). Applicant respectfully submits that the claims are patentable over these references for at least the following reasons, and requests removal of these rejections.

Applicant respectfully submits that the combination of **Idlas**, **Lustig** and **Peiffer** does not render any claims unpatentable, because in **Lustig** there is no teaching, suggestion or motivation overcoming **Idlas**’ express teachings against substituting the PVDC oxygen barrier layer for the EVOH core (oxygen barrier) layer of **Idlas**. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion or motivation to do so. M.P.E.P. § 2143.01. A prior art reference must be considered in its entirety, including disclosures that teach away from claims. M.P.E.P. § 2141.02, at 2100-120.

First, the Examiner asserts that claims 1-21, 48-87 and 94-99 are unpatentable over the combination of **Idlas**, **Lustig** and **Peiffer** because the PVDC and EVOH are allegedly “functionally equivalent” to each other as gas barrier layers. Specifically, with regard to **Idlas**, the Examiner states in relevant part:

8. Though **Idlas** teaches the use of EVOH as the gas barrier layer, it is well known in the art that EVOH, nylon and PVDC, including vinylidene chloride-vinyl chloride and vinylidene chloride-methyl acrylate copolymers, are functionally equivalent barrier materials utilized in the art wherein **Idlas** specifically teaches that known packaging films typically contain EVOH, nylon, and/or PVDC barrier layers and that EVOH is an alternative barrier layer for PVDC in terms of recycling (Col. 2, line 43-Col. 3, line 37) and hence one having ordinary skill in the art would have been motivated to utilize any of these known and conventional barrier materials, including any conventional PVDC barrier material, based on the desired barrier and film properties for a particular end use, particularly if recycling is not a desired property, given the reasonable expectation of success in order to achieve similar gas barrier properties.

(Office Action at 4.)

Applicant respectfully disagrees. In light of the Dow Specification attached at **Exhibit A**, Applicant asserts that these barrier layer material have different moisture barrier layer properties.

Idlas does not provide a core layer comprising a barrier material other than EVOH. **Idlas** explicitly states that “[t]he invention in *all* its embodiments comprises... and EVOH gas barrier layer.” (col 7, lines 25-35, emphasis added). **Idlas** also repeatedly asserts that “[t]he EVOH core layer controlled the permeability of the film with regard to gases such as oxygen.” (col. 26, lines 55-56; col. 28, lines 62-63).

Second, the Examiner asserts that with regard to **Lustig**:

Lustig et al teaches that a biaxially oriented, heat shrinkable film comprising a gas barrier core layer that may be either ethylene vinyl alcohol or polyvinylidene chloride with a vinylidene chloride content of 70-95% copolymerized with vinyl chloride acrylate esters provides a film suitable for packaging food articles such as meat products . . . as similarly used by **Idlas**, and hence one having ordinary skill in the art at the time of the invention would have been motivated to utilize the functionally equivalent polyvinylidene chloride taught by **Lustig** having a vinylidene chloride content of 70-95wt% in place of the EVOH gas barrier layer in the invention taught by **Idlas**.
(Office Action at 4-5.)

Applicant respectfully disagrees. **Lustig** teaches advantageously high shrinkage values at elevated temperatures of very low density polyethylene (VLDPE). See, e.g., **Lustig** at col. 10, lines 11-17. **Lustig** presents Example II showing that VLDPE monolayer films have “highly desirable” high shrinkage values and Example III showing foodstuff bags made from monolayer VLDPE have “substantially improved shrinkage properties.” The barrier layer of **Lustig** is selected to be an oxygen barrier (see, for example, col. 16, line 45) and can be selected from a variety of materials, including EVA, PVDC, EVOH and others (see, for example, col. 15, lines 7-9), which provide vastly different moisture barrier properties (See, for example, attached Dow Specification for MA-Saran). **Lustig** provides no teaching or suggestion to select any particular barrier layer from among the various barrier materials disclosed therein.

Third, with regard to the teachings of **Peiffer**, the Examiner asserts that:

Though **Idlas** teaches that the packaging film has low extractable levels and contains a first layer preferably comprising a propylene-ethylene copolymer formed in the presence of metallocene catalysts, wherein it is well known in the art that metallocene catalysts have narrow molecular weight distribution

Mw/Mn, **Idlas** does not teach the n-hexane extractable content and the Mw/Mn of the propene copolymer as instantly claimed.

11. However, it is well known that Mw/Mn and n-hexane extractable content are the results of the polymerization process and are result-effective variables affecting the properties of the copolymers formed, particularly the melt processability and heat seal properties of the polymer as evidenced by **Peiffer** et al. **Peiffer** et al specifically teach a packaging film comprising a propylene polymer containing at least 90wt propylene units and not more than 10wt% ethylene units wherein the propylene polymer is polymerized in the presence of metallocene catalysts producing a polymer structure having an n-heptane extractable content of less than 1.0wt% and a low molecular weight distribution of less than 4, particularly 1.5 to 2.7, wherein the structure of the propylene polymer provides a packaging film having improved film properties including elasticity and high gloss (Col. 3, line 38 – Col. 4, lines 67. [sic.]). Hence, given the reasonable expectation of success, one having ordinary skill in the art at the time of the invention would have been motivated to utilize routine experimentation to determine the optimum polymerization conditions to produce the metallocene-catalyzed propene copolymer taught by **Idlas** having the desired Mw/Mn and n-hexane extractable content for a particular end use, wherein **Peiffer** et [sic.] teach the production of metallocene-catalyzed propylene copolymers having n-hexane extractable content and Mw/Mn values as instantly claimed provide improved film properties. (Office Action at 5-6).

Applicant respectfully disagrees. Applicant submits that one of ordinary skill in the art would not read **Peiffer** as teaching the “optimization” of the metallocene-catalyzed synthesis of the propene copolymer first layer of **Idlas** for at least two reasons: (1) **Idlas** and **Peiffer** teach propene copolymers with different melting point ranges, and (2) the films of **Peiffer** are not heat shrinkable while those of **Idlas** are.

First, in selecting which polymers to use in a multilayer film, one skilled in the art must consider not only the function of each layer in the final film, but also the manner in which the film will be made and processed. The manufacture and processing of multiple layer polymer films requires consideration of the relative melting points of the component layers.

The present application teaches, *inter alia*, a first layer of a multilayer film comprising a propene copolymer with certain α -olefins with a melting temperature of

between about 100°C and 145°C (as recited in independent claims 1 and 48), and preferably between 110°C and 130°C (as recited in dependent claims 7, 16, 17, 18, 51, 60-62, 66, and 75-77), and more preferably between 120°C and 130°C (as recited in dependent claims 8, 52, and 67). Clearly, the propene polymers shown by example in **Peiffer** have a melting point temperature range higher than the polymers in **Idlas**, which are indicative of a different structure with greater heat shrink resistance. Therefore, the propene copolymers of **Peiffer** are not simply a drop-in for the propene copolymer of **Idlas** in heat shrinkable films to obtain the film as presently claimed in claims 1 and 48.

Peiffer teaches a metallocene-catalyzed “base ply” polymerized in the presence of metallocene catalysts producing a polymer structure with a melting point between 140°C-175°C, preferably from 150°C – 165°C, and most preferably between 155°C -162°C (col. 3, lines 48-57). Indeed, **Peiffer** shows examples of only propene homopolymers that have melting temperatures of between 147°C and 161°C. Moreover, **Peiffer** notes that the film according to the invention is “distinguished by improved tear propagation resistances in the longitudinal and transverse directions of the film, the other properties of the film, in particular the mechanical properties and the shrink resistance, not being disadvantageously impaired.” (col. 8, lines 8-12).

Secondly, one of ordinary skill in the art would not be motivated to consider **Peiffer**, because it teaches propene copolymers with a higher melting temperature in a base ply that likely may not be as suitable for a sealing layer. One skilled in the art selecting which polymers to include in a multilayer shrinkable film would also consider the compatibility of the film components with respect to shrink properties and processing properties.

The temperature range of the propene copolymer is integral to teachings of **Idlas**. **Idlas** teaches that the melting point of the propene copolymer is considered in: (1) the manufacturing of the multilayer film by extrusion (col. 14, lines 40-49, teaching orientation at “temperatures below the melting points for the predominant resin comprising each layer...”), (2) heat shrinking temperatures (col. 14, line 67 – col. 15, line 5, teaching heat shrinking of multilayer films below the melting temperature of major components of the films), (3) selecting a draw point or orientation temperature for biaxially stretching and

orienting the multilayer film (col. 19, lines 63-64, teaching “The draw point or orientation temperature was below the predominant melting point for each layer...”) and (4) the recycling of polymers comprising PVDC comprising other polymers with different melting points (col. 3, lines 25-27, teaching “...recycling of PVDC polymers is difficult, particularly where the waste polymer is mixed with other polymers having different melting points.”).

One of ordinary skill in the art could not apply the teaching of **Peiffer** to “optimize” the synthesis of the propene copolymer portion of a multilayer film of **Idlas** with any assurance that the resulting polymer would retain the desirable physical properties of heat shrinkage, low molecular weight distribution and low n-hexane extractables if it was reformulated to be capable of being extruded and oriented at the different temperatures taught in **Idlas**.

The films taught by **Peiffer** are not heat shrinkable, as evidenced by the data in the Table at columns 15 and 16, wherein the films of Ex. 5 and 6 have shrinkage of 3.0% or less in both directions. In contrast, the present application, at page 11, lines 25-28, teaches that the film has a shrinkage of 20% or higher at 90°C, and at page 36, lines 18-26, teaches that the shrinkage may be more than the comparative example films A-E. **Peiffer** provides no teachings how to modify its propylene copolymers to obtain high shrinkage, low melting point temperature and retain the low extractables required by the present claims. Accordingly, there is no expectation of success that one could optimize **Peiffer** without undue experimentation to achieve high heat shrinkable properties. In contrast, one property for the film expressly recited by at least some of the present claims, is that the film be heat shrinkable beyond that discussed in **Peiffer**.

Absent the teachings of the present application, one of ordinary skill in the art seeking to synthesize a first layer of a multilayer film comprising a propene copolymer with a melting temperature of between about 100°C and 145°C, and more specifically between 110°C and 130°C or between 120°C and 130°C, in accordance with the instant application, could not reasonably be sure that the teachings of **Peiffer**, directed to a polymer having a higher melting point range of between 140°C-175°C (most preferably between 155°C - 162°C), could be applied to effectively optimize the **Idlas** propene copolymer, which has a

melting point of between 126°C - 145°C, without disrupting the effectiveness of the manufacturing conditions and resulting film properties recited for the **Idlas** films.

Moreover, **Peiffer** teaches using the metallocene catalyzed propene copolymer in the base ply of a film, preferably with top plies on either side of the base ply. The present claims require the propene copolymer to be at least in the first layer, which is the heat sealing layer. As taught by the present application, a low melting temperature is important for this first layer to improve the sealing abilities of the film across a broader temperature range. Therefore, if one of ordinary skill in the art would merely substitute the polymer of **Peiffer** into the film of **Idlas**, one would expect to obtain a film without the claimed physical properties.

In contrast to **Peiffer**, **Idlas** teaches preferred propene copolymers of propene and certain α -olefins, wherein copolymers have a melting point of less than 140°C or between about 126°C - 145°C, preferably between about 129°C - 136°C. (Abstract; col. 10, lines 30-33). Also, **Idlas** teaches that an object of the invention is to make a film having high heat shrinkage properties. (col. 5, lines 23-25).

Applicant requests removal of this rejection because there is no teaching based on **Peiffer** to synthesize such a propylene copolymer with all the properties required by **Idlas**. M.P.E.P. § 2145 (citing *In re McLaughlin*, 443 F.2d 1392, 1395, 170 U.S.P.Q. 209, 212 (CCPA 1971)).

III. Rejection of claims 22-46 and 88-92 under 35 U.S.C. § 103(a) over Idlas, Lustig and Peiffer

In the Office Action, the Examiner rejected claims 22-46 and 88-92 under 35 USC § 103(a) as being obvious over **Idlas** in view of **Lustig** and **Peiffer**. Specifically, the Office Action states:

Though **Idlas** teaches the packaging films may further comprise additional intermediate layers, **Idlas** does not specifically teach the incorporation of an intermediate or transition layer between the first propene copolymer layer and the second ethylene blend layer, however, it is well known in the art that tie or

intermediate layers can be provided between two adjacent layers wherein the tie or transition layer is a blend of the polymer materials utilized in the two adjacent layers thereby providing improved adhesion between the two layers. Hence, one having ordinary skill in the art would have been motivated to provide an intermediate layer as taught by **Idlas** between the first propene layer and the second ethylene blend layer wherein it would have been obvious to one having ordinary skill in the art at the time of the invention to utilize routine experimentation to determine the optimum blend composition and thickness of the intermediate layer based on the composition of the first and second layers of the film taught by **Idlas** to provide the desired adhesion between the two layers.
(Office Action at pp. 5-6).

Applicant believes the basis for this rejection is obviated by the current claim amendments. The claims as amended provide a third layer that also provides moisture barrier properties. **Idlas** does not teach or suggest a core layer that also provides moisture barrier properties, such as for MA-Saran. **Idlas** does not provide a core layer comprising methyl acrylate and vinylidene chloride copolymer composition of the claims as currently amended. **Lustig** does not disclose the intentional selection of a barrier layer amongst all the possible barrier layer materials disclosed therein that would provide a moisture barrier. **Lustig** provides no teaching or suggestion to select a barrier layer material based on moisture barrier properties which provide the moisture barrier properties of the composition as recited in the certain claims, based on how one skilled in the art would have read the specification at the time of filing (as evidenced, for example, attached Dow Specification for MA-Saran). **Peiffer** also provides no teaching or suggestion of a core moisture barrier layer as recited in the claims as currently amended. **Peiffer** provides no layer comprising vinylidene chloride copolymer that would provide the moisture barrier properties.

Accordingly, Applicant believes the basis for this rejection has been obviated and Applicant requests reconsideration and removal of this rejection on this ground.

IV. Rejection of claims 1-46, 48-92 and 94-99 under 35 U.S.C. § 103(a) over Idlas and Tsukamoto

In the Office Action, the Examiner rejected claims 1-46, 48-92 and 94-99 under 35 USC § 103(a) as being obvious over **Idlas** in view of **Tsukamoto et al.** (US Patent No. 6,063,462) (“**Tsukamoto**”). Specifically, in the Office Action it is asserted that “one skilled in the art would have been motivated to utilize PVDC as taught by **Tsukamoto et al** as a functionally equivalent gas barrier material to EVOH in the invention taught by **Idlas**.” (Office Action at page 7).

Applicant respectfully disagrees. First, applicants submit all the comments made above with regard to **Idlas** apply here. **Idlas** does not teach that PVDC is functionally equivalent to EVOH in the film structures taught by **Idlas**. **Idlas** provides no disclosure to motivate one of ordinary skill in the art to replace EVOH with PVDC in the film structures of **Idlas**. **Tsukamoto** does not teach that PVDC may be a drop-in substitute in the film structures such as disclosed by **Idlas**. **Tsukamoto** generally refers to broad classes of metallocene-catalyzed poly-alpha-olefin polymers. But in examples, **Tsukamoto** discloses the use, not of propylene, but only of metallocene-catalyzed ethylene copolymers. Indeed, the examples are based only on metallocene-catalyzed ethylene copolymers, and provide no data or guidance as to the differences between propene and ethylene copolymers. In the examples, **Tsukamoto** uses PVDC only when next to layers consisting of EVA, M-EVA or EEA polymers. In contrast, **Idlas** uses a blend of VLDPE and EVA in the layer next to EVOH. Because **Tsukamoto** teaches using PVDC only with a different layer next to it than taught by **Idlas**, one of ordinary skill in the art would not necessarily merely drop in the PVDC without also taking other teachings from **Tsukamoto**, such as altering the materials in the layers next to the barrier layer. Therefore, taking the references as a whole, one is not necessarily motivated to obtain the invention as presently claimed.

With respect to **claim 48** and claims dependent therefrom, the Office Action asserts that “Applicant has provide [sic.] no statement on the record or in the instant disclosure that

incorporation of the additional layer taught by Idlas would materially affect the basic and novel characteristics of the instant invention... ." (Office Action at page 16, emphasis in original omitted).

Applicant respectfully disagrees. Applicant reiterates that independent claim 48 and the claims dependent therefrom are limited to films consisting essentially of the recited layers. This excludes the use of a core oxygen barrier layer. Since both **Idlas** and **Tsukamoto** disclose the use of core barrier layers and do not provide any motivation to one of ordinary skill in the art to not use a core barrier layer, these claims are not obvious.

More specifically, the novel characteristics of independent claim 48 include the combination of the claimed layers *without* the core gas barrier layer. Absence of a core gas barrier layer can impart different physical properties to the multilayer film. As noted at page 12 of the specification, the films and bags may be useful for food and non-food particles. Therefore, the use of a simple film structure having the shrinkability, for example as claimed in claims 94-99, and taking advantage of only the claimed layers without a gas barrier layer may provide a low cost alternative for packaging non-food articles where diffusion of oxygen into the bag is not a concern. Examples 3 and 4 in the application are directed to this embodiment of the invention.

V. Rejection of claims 22-46 and 88-92 under 35 U.S.C. § 103(a) over Idlas and Tsukamoto

The Office Action asserts that one skilled in the art would understand how to make and use the intermediate layers of the present invention based on the disclosures of **Idlas**, and **Tsukamoto**. (Office Action at page 9). Specifically, the Office Action asserts that, "**Idlas** teaches that the packaging films may further comprise additional intermediate layers... [and] **Tsukamoto** et al further teach that adhesive or intermediate layers may be disposed between respective layers to ensure sufficient adhesion between adjacent layers (col 7, lines 34-36)." (Office Action at page 9).

Applicant believes the basis for this rejection is obviated by the current claim amendments which add a third layer with particular moisture barrier properties in addition to the intermediate layer of these claims. In addition to the intermediate layer, the claims have been amended to provide a core layer that also provides moisture barrier properties. **Idlas** does not teach or suggest a core layer that also provides moisture barrier properties. **Idlas** does not provide a core layer comprising the methyl acrylate and vinylidene chloride copolymer composition of the claims as currently amended. **Tsukamoto** provides no teaching on selecting a particular gas barrier layer to provide additional moisture barrier properties.

Tsukamoto also provides no guidance to modifying the propene copolymer of **Idlas** to obtain the required Mw/Mn or n-hexane extractables for a metallocene-catalyzed propene copolymer as presently claimed. Accordingly, undue experimentation would be required without the benefit of the teaching of the present application.

Accordingly, the basis for this rejection has been obviated and Applicant requests reconsideration and removal of this rejection on this ground.

CONCLUSION

For the reasons discussed above, Applicant requests reconsideration and withdrawal of all rejections in this case.

Respectfully submitted,

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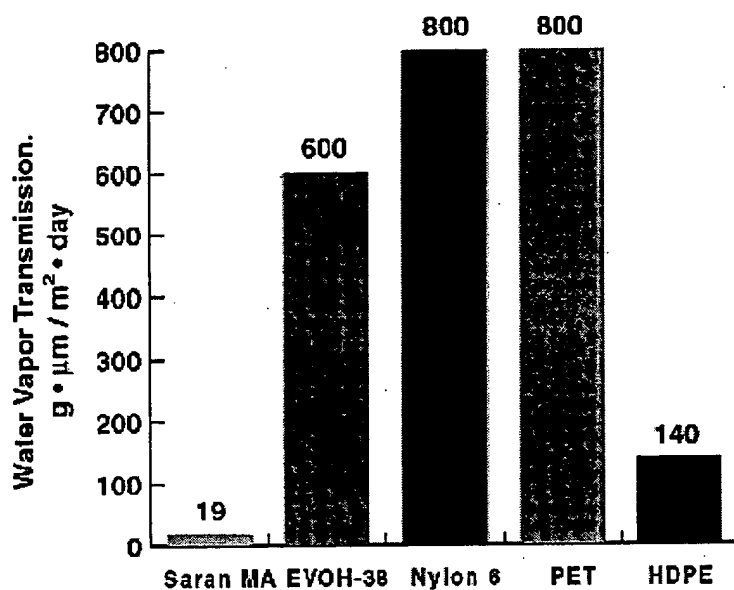
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Saran Resins and Films Saran Films

Moisture Barrier Performance

To keep dry, packaged goods like crackers, cereal, and shelf-stable baked goods fresh, you need a high-performance moisture barrier. In these applications, Saran excels, delivering moisture barrier performance that keeps dry foods dry and crisp.

Water Vapor Transmission at 38°C, 90% relative humidity¹



¹Information displayed is for the conditions noted only.

Third Office Action Response
09/652,591

IDLAS, Scott A. (Applicant)

EXHIBIT A

IRRADIATED BIAXIALY ORIENTED FILM

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